Forest Health Protection
Pacific Southwest Region

Date: May 11, 2009
File Code: 3420

To: District Ranger, Mt. Hough Ranger District, Plumas National Forest

Subject: Evaluation of hazard tree marking within the Moonlight Fire (NE09-03)

At the request of Ryan Tompkins, Silviculturist, Mt. Hough Ranger District, I visited the 2007 Moonlight Fire on May 7, 2009 to inspect a sample of fire-injured trees previously marked for removal in 2007/2008 for the Moonlight Safety and Roadside Hazard Tree Removal Project (this project is now incorporated into the larger Moonlight and Wheeler Fires Recovery and Restoration Project). These trees are located along FS roads 27N09 and 27N09D and were previously photographed and submitted by Mr. Chad Hanson in his declaration opposing the Moonlight Safety and Roadside Hazard Tree Removal Project (Case 2:08-cv-01957-FCD-EFB, September 15, 2008). The objectives of this visit were to determine the potential for tree failure based on structural defects and to determine if trees would meet the current criteria for fire-injured tree mortality, at the probability of mortality (Pm) = 0.7 level (Smith and Cluck 2009). The location and lean of each tree was also noted to determine its potential to strike a road.

Background

The Moonlight Fire started on September 3, 2007 and burned 64,997 acres of mixed conifer in the transition zone between the westside mixed conifer and eastside pine forest types. The conifer species, and their approximate composition, found within the burn consist of 13% ponderosa pine (*Pinus ponderosa*) and Jeffrey pine (*Pinus jeffreyi*), 15% incense cedar (*Libocedrus decurrens*), 10% Douglas fir (*Psuedotsuga menziesii*), 2% sugar pine (*Pinus lambertiana*), < 1% lodgepole pine (*Pinus contorta*), and 60% red fir (*Abies magnifica*) and white fir (*Abies concolor*). Approximately two-thirds of the acreage in this fire burned at a high severity killing nearly all vegetation. The proposed roadside hazard removal project utilized guidelines based on the Forest Health Protection marking guidelines for fire-injured

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trees (Smith and Cluck 2007) and Plumas National Forest Roadside/Facility Hazard Tree Guidelines and Identification Criteria. Dead trees that met the Plumas National Forest (PNF) Roadside/Facility Hazard Tree Guidelines and Identification Criteria within 150' of a road were considered hazardous. Green trees that were within striking distance of a road and had structural defects were considered hazardous. Green trees that were within striking distance of a road and met the probability of mortality criteria were also considered hazards for the purposes of this project. Proposed salvage away from roads was limited to dead trees only (no green needles).

Observations

The areas where Mr. Hanson selected and photographed trees are primarily within low, moderate and high fire severity vegetation burn severity areas. The following vegetation burn severity descriptions are taken from a previous FHP site visit three months after the fire (FHP Evaluation #NE07-08):

Low Severity (0-25% BA mortality)

These areas burned mostly as surface fires with minimal crown scorching. However, cambium sampling revealed a wide range of injury from near complete girdling at the root collar to very little injury. The range of cambium injuries found in individual sampled trees was similar regardless of tree diameter. An exception to this appeared to be in the mid-sized ponderosa and Jeffrey pine (~12-20" DBH) where the extent of observed cambium injury was not as great.

Moderate Severity (25-50% BA mortality)

These areas also burned mostly as surface fires but with greater amounts of crown scorch, including complete crown scorching and consumption of individual trees and groups of trees. These stands contained higher levels of cambium injury on average than the low severity areas with many trees sustaining heat killing of cambial tissue higher on the bole.

High Severity (>50% BA mortality)

These areas burned at very high intensities, mostly as crown fires, with very little tree survival. Very few trees in these areas have any remaining green foliage and most experienced nearly complete crown consumption. These trees also have very high levels of cambium injury extending high on the bole.

Eleven of Mr. Hanson's trees were found along an 8.4 mile stretch of road and evaluated during this visit. Trees with green foliage were evaluated for structural defects and to determine if they met the new fire-injured tree marking guidelines using diameter (DBH), presence/absence of red turpentine beetle (RTB) attacks (yellow and sugar pines only) and percent crown length killed (PCLK) at the probability of mortality (Pm) = 0.7 level (Smith and Cluck 2009). Tree crowns should be evaluated within 1 year post-fire as scorched and blackened needles will drop from the crown causing inaccurate estimates of crown injury. Therefore, the following observations do not attempt to second guess the original crown injury determinations that were based on percent crown length scorched.

Photo Point 1, Tree #1: Dead yellow pine that is within striking distance of the road. This tree has two crooks in the bole and no significant lean away from the road prism. High severity area. (Case 2:08-cv-01957-FCD-EFB Document 55-6 Filed 09/15/2008 Page 1 of 3, Photo 1)

Determination: Meets PNF Roadside/Facility Hazard Tree Guidelines and Identification Criteria

Photo Point 1, Tree #2: Dead yellow pine with slight lean away from the road. This tree is within striking distance of the road prism. High severity area. (Case 2:08-cv-01957-FCD-EFB Document 55-6 Filed 09/15/2008 Page 1 of 3, Photo 3)

Determination: This tree does not technically meet the PNF Roadside/Facility Hazard Tree Guidelines and Identification Criteria hazard tree criteria due to the slight lean away from the road. However, even though the slight lean reduces the likelihood of this tree hitting the road, it does not eliminate the possibility, especially since this tree is well within the 150 foot buffer zone and is over 120' tall.

Photo Point 2, Tree #3: Sugar pine (74" DBH) with approximately 70 PCLK and within striking distance of the road. Basal scars evident but amount of decay unknown. Low to moderate severity; tree is located in an area where crown torching occurred. (Case 2:08-cv-01957-FCD-EFB Document 55-7 Filed 09/15/2008 Page 1 of 8, Photos 4 -7)

Determination: Meets the Pm = 0.7 guideline for sugar pine (PCLK and RTB absent). This tree does not technically meet the PNF Roadside/Facility Hazard Tree Guidelines and Identification Criteria hazard tree criteria due to the slight lean away from the road. However, even though the slight lean reduces the likelihood of this tree hitting the road, it does not eliminate the possibility, especially since this tree is very close to the road prism.

Photo Point 2, Tree #4: Yellow pine (47" DBH) with approximately 30 PCLK, RTB present, no structural defects and within striking distance of the road. Low to moderate severity; tree is located in an area where crown torching occurred. (Case 2:08-cv-01957-FCD-EFB Document 55-7 Filed 09/15/2008 Page 1 of 8, Photos 8 -11)

Determination: Meets the Pm = 0.7 guideline for yellow pine (DBH, PCLK and RTB present).

Photo Point 2, Hanson Photo #11:

Mr. Hanson submitted and described this photo as the forest adjacent to Tree # 4. It clearly focuses on the green pocket of trees outside of the crown torching pocket Tree # 4 is located within (Figures 1 and 2).

Figure 1. Photo submitted by Mr. Hanson

Figure 2. Panorama taken May 7, 2009 that includes Figure 3 (Mr. Hanson's Photo) and Tree # 4.

Photo Point 3, Tree #5: Dead Douglas-fir within striking distance of the road but with significant lean away from the road. There is also a large sugar pine blocking this tree from the road. This snag appears to be 100% cull. High severity area. (Case 2:08-cv-01957-FCD-EFB Document 55-7 Filed 09/15/2008 Page 1 of 8, Photos 12 -13)

Determination: This tree does not meet the PNF Roadside/Facility Hazard Tree Guidelines and Identification Criteria due to the lean away from the road.

Photo Point 4, Tree #6: Yellow pine (37" DBH) with approximately 25 PCLK, RTB present, no significant lean and within striking distance of the road. High severity area. (Case 2:08-cv-01957-FCD-EFB Document 55-7 Filed 09/15/2008 Page 1 of 8, Photos 14 - 15)

Determination: Meets the Pm = 0.7 guideline for yellow pine (DBH, PCLK and RTB present).

Photo Point 5, Tree #7: Yellow pine (48" DBH) with approximately 30 PCLK, RTB present, no significant lean, exposed roots on cut bank and within striking distance of the road. Moderate to high severity areas. (Case 2:08-cv-01957-FCD-EFB Document 55-7 Filed

09/15/2008 Page 1 of 8, Photos 16-17)

Determination: Meets the Pm = 0.7 guideline for yellow pine (DBH, PCLK and RTB present). Also meets PNF hazard tree criteria due to exposed roots.

Photo Point 5, Tree #8: Yellow pine (33" DBH) with approximately 30 PCLK, RTB absent, and within striking distance of the road. Moderate to high severity areas. (Case 2:08-cv-01957-FCD-EFB Document 55-7 Filed 09/15/2008 Page 1 of 8, Photos 18-19)

Determination: Does not meet the Pm = 0.7 guidelines (DBH, PCLK and RTB absent) or the PNF Roadside/Facility Hazard Tree Guidelines and Identification Criteria.

Photo Point 6, Hanson Photo 20: (Case 2:08-cv-01957-FCD-EFB Document 56 Filed 09/15/2008 Page 1 of 8, Photo 20)

This area was photographed by Mr. Hanson to depict a mosaic pattern of burn severity. The entire area in the upper half of the photo depicts unburned acres outside of the Moonlight Fire perimeter (Figures 3 and 4). Figure 5 depicts the direction of the photo in relation to the fire perimeter.

Figure 3: Photo taken by Mr. Hanson in 2008

Figure 4: Photo taken on May 7, 2009

Photo Point 7, Tree #9: Yellow pine (44" DBH) with approximately 30 PCLK, RTB not assessed, may not be within striking distance of the road. High severity area. (Case 2:08-cv-01957-FCD-EFB Document 56 Filed 09/15/2008 Page 2-3 of 8, Photos 21-22)

Determination: Does not meet the Pm = 0.7 guideline for yellow pine (DBH and PCLK only {RTB not assessed}) or the PNF Roadside/Facility Hazard Tree Guidelines and Identification Criteria.

Photo Point 8, Trees #10-11: Two sugar pine (30 and 28" DBH) within striking distance of the road, ≥ 70 PCLK, RTB absent. Low severity area. (Case 2:08-cv-01957-FCD-EFB Document 56-3 Filed 09/15/2008 Page 1-2 of 5, Photos 28-29)

Determination: Both trees meet the Pm = 0.7 guideline for sugar pine (PCLK and RTB absent).

Note: Adjacent to these two sugar pine were two other sugar pine that met the Pm = 0.7

guideline and were not marked for removal.

Discussion

It is clear from the observations of marked trees throughout the Moonlight Fire and discussions with District personnel that hazard tree marking guidelines as described in the Environmental Impact Statement for the Moonlight and Wheeler Fires Recovery and Restoration Project were fully utilized by field crews in making their hazard determinations for individual trees. FHP personnel also spent time in the field on March 6, 2008 going over fire-injured tree marking guidelines with one of the marking crew leaders to insure that the individual tree criteria were fully understood.

When any specific marking criteria are applied in the field it is expected that there will be some level of variability in the assessment of individual trees among tree marking crew members. The scale of this type of project does not allow for detailed and time consuming measurements of each variable when making a fire-injured and/or hazard tree determination. (The Moonlight Safety and Roadside Hazard Tree Removal Project covered 4,389 acres; within this area approximately 57,666 trees were designated for removal out of over 320,400 total trees assessed). Marking crews are expected to make a rapid assessment, with a high level of accuracy, for each individual tree and move on. Therefore, it should be expected that some trees will be marked for removal, fully attempting to meet the intent of the guidelines, which may not meet the given criteria. The opposite is also true; trees that may meet the given criteria will not be marked for removal. Trees that fell into this second category were also observed and documented during this site visit. Out of the approximately 320,400 trees assessed by the marking crews in the Moonlight Safety and Roadside Hazard Tree Removal Project, approximately 68 percent were within high severity areas (characterized by 75 – 100 % basal area mortality) with the majority of trees marked for removal being completely dead (no green needles). This made the determination of hazard trees relatively simple with little potential for significant errors. Furthermore, based on the majority of trees observed along the 8.4 miles of road being dead (no green needles); thousands of roadside hazard trees were designated correctly.

Based on the observations and information provided above, it appears that the number of trees that may have been incorrectly assessed as hazards (or non-hazards), is likely very low.

If you have any questions regarding this report and/or need additional information please contact me at 530-252-6431 or at dcluck@fs.fed.us.

/s/ Danny Cluck

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Lat 40.22098 Lon -120.72105

Figure 5. Location of photo points, travel route, and field of view for photo #20.